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Variables Affecting the Cardiovascular Responses to Chronic Smoking.

Although several epidemiologic and pathologic studies have suggested an increased incidence of cardiovascular disease in the smoking population, a direct causal relationship between chronic smoking and cardiac disease has not been established. This project will study whether the heart is affected by chronic smoking of cigarettes in the experimental animal under control conditions at a usage level that is common in man. The effects of smoking the equivalent of one or two packs of cigarettes/day in man is to be determined in purebred beagles with chronic tracheostomies, using litter mate controls. The investigators' preliminary studies in the beagle have suggested that cardiovascular abnormalities may be produced with relatively large cigarette exposure. They wish to determine the threshold for this response and the influence of dietary variables.

Smoking animals receiving high lipid diet will be matched with appropriate controls to determine if plasma lipid levels may affect the cardiac response to smoking. Since smoking is often combined with moderate to heavy ethanol intake in man, an agent which can be associated with cardiac disease in humans and experimental animals, the researchers propose to examine its interaction with cigarette inhalation and whether quantitative or qualitative differences are observed when compared to controls. They are particularly interested in evaluating alterations of blood coagulation as a potential factor in diminishing blood flow in the coronary microcirculation and to altered myocardial function. Their early studies in the purebred beagles indicate that a hypercoagulable state is induced in the smoking dogs compared to their litter mate controls during the initial 12-18 months. The relationship of the development of hypertension to the turnover of ^{125}I -labeled fibrinogen and deposition of the protein in the microcirculation of the kidney and myocardium is to be assessed. The investigators propose to determine whether progression of this abnormality occurs with time and the interrelations of altered myocardial function, metabolism and morphology.

As an important correlative study, the morphologic status of the lungs and pulmonary vasculature in these animals will be evaluated by Dr. Sheldon Sommers, professor of pathology at Lenox Hill Hospital, New York City.

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